

**2008 Northern Rockies Incident Management Teams  
Annual Team Meetings  
Operations/Safety Breakout Notes**

**Structure Protection & Population Protection – Bob Fry**

- Debate over what Structure Protection
  - o Hasn't really changed – two types of incidents: 1) immediately emerging on the structures or burning through assets, structures, and property **or** 2) large fire threatening to come into an area where assets, structures, and values at risk exist. *The first really has life safety issues beyond structure protection for the general public.*
  - o **THE INGRESS/EGRESS ROUTES ARE WHERE THE GENERAL PUBLIC ARE MAIMED OR KILLED.**
- Think Safety Zone at structure – **if it doesn't exist don't commit during an emerging fire.**
  - o In the last few years, the number of firefighters killed during structure protection activities has increased.
  - o Questions that need to be asked: Do we have defensible space? Can we survive at this location? Check the IRPG, Fireline handbook for Structure Protection checklists.
  - o We're in a *Catch-22* situation: the public expects firefighters to protect their structures, but we're taking personnel away from activities that could stop the fire.
- Real issues are continuous heavy fuel loading up to the structure, access and proximity to a safety zone, what the property owners have done to protect or not protect themselves, fire weather & behavior at time of impact, resource availability
- Restrictions and vague direction on structure protection tactics imposed by Agency Administrators are placing fire personnel at risk. Clarification by Agency Administrators is desperately needed.
- Responsibility for private structures still lies with the owner. Message to public needs to be expanded to alert them that fire personnel will not always be available to save their structures.
- Lack of forest management on federal lands exacerbates the problem of structure protection on private lands. If thinning, harvesting, etc. operations were still taking place, it would give the firefighters better fuel conditions to work with and allow fires to be slowed/stopped prior to 'blowing out' of the federal lands.
- Protection/Prevention activities are a shared responsibility of the land management/fire suppression agencies (Fed, State, Local) and the private property owners. During interagency wildfire situations, jurisdictional lines disappear. Federal agency and/or line officer's direction seems to be drawing a line in the sand.
- Point Protection – Due to the politics of the situation, local land ownership and their priorities prevented operations personnel from being proactive and taking care of protection needs when there was time to safely do so. Structure protection had to take place when the fire was bearing down on the structures, placing firefighters in situations where they had to take risks, eat too much smoke, etc.
- The variety of firefighter training in the implementation structure protection strategy and tactics needs to be more uniform across the country. Management of these resources with varied training backgrounds presents an operational challenge.
  - o Training firefighters on how & why structures burn during a wildfire event will help minimize the number of personnel needed for structure protection activities (i.e., fires burning from wind-blown embers opposed to radiant heat).

- Utilizing personnel to perform structure protection activities takes critical resources away from fire suppression. The best scenario is to stop the fire prior to impacting structures and communities.
- Clear direction on what constitutes Structure Protection Doctrine from NWCG, Agency Administrators, and Line Officers is needed to create more uniform operating parameters for fire personnel.
- Tactics discussion - *Tactics discussion seems to be where the confusion lies*
- Dealing with the Prepare, Stay, and Defend or Leave Early mentality. Lot's of information on the FireSafe Montana web site. [www.firesafemt.org](http://www.firesafemt.org).
- Managing long term fires threatening areas over 30-60 day timeframes. Also hasn't changed a whole lot with regards to local impacts. Same problems existed in Cooke City in 1988 that were talked about at Jocko discussion. Public meetings (do them early and often) are critical and being realistic with information about what the fire could look like on any given bad day.  
Remember: **THE ACCESS ROUTES ARE WHERE THE GENERAL PUBLIC ARE MAIMED OR KILLED.**
- Accessing an affected fire area – don't forget to coordinate this closely with agencies, especially law enforcement. Tell the residents about the new hazards within the fire area.

## **FACILITATED LEARNING ANALYSIS – PAUL CHAMBERLIN**

*Reinforcing High Reliability by Taking a Hard Look at Near Misses*

"A million nuance intuitive insights"

### Three Concepts

- 1) When we focus on blame, learning suffers
- 2) Not re-fighting the past fire. What fire are we fighting?
  - a. We are focused the next fire and how future decision-making.
  - b. "Recognition Primed Decision Making" by Gary Cline
    - i. Using your experience, rather than an analytical approach, to guide your decision-making.
    - ii. Through after-action reviews and facilitated learning, knowledge and experiences can be passed on to those that have yet to see the event(s)
    - iii. Sources of Power by Gary Cline
- 3) Facilitated Learning Analysis is After-action Review on Steroids

### Triggers for FLA – Any opportunity for learning

Examples:

- o Nuttall Entrapment Investigation (July 2004)
- o I-90/Tarkio (August 2005)
- o R-5 Brake Maintenance (June 2006)
- o Devil's Den (2006)
- o Camden (March 2006)
- o Little Venus (July 2006)
- o Balls Canyon (July 2006)
- o East Roaring (July 2006)
- o Derby Helicopter Evacuation (August 2006)
- o Deep Creek Tree Felled on Pick-up (August 2006)

- Gash Creek (September 2006)
- Lessons Learned – Escaped Prescribed Fires (October 2006)

#### 2007 Examples:

- Madison Arm Fire – Engine Entrapment
- Ahorn fire – DIVS Shelter Deployment
- Poe Cabin – Three Burned Firefighters
- Rombo Fire – Snag Injury

#### Frequently Asked Questions

- What type of documentation do we need for these events?
  - What type of event.
  - What did the firefighters report that happened.
- 
- Who can be a facilitator for FLA?
  - Anybody can be, look at the FLA documents and library examples.

#### The Emerging Fire Management Culture

- Pulaski/Doctrinal Documents
- Human Factors Workshops
- Leadership Curriculum – AARs
- Lessons Learned/Learning Org.
- Just Culture
- Theory 'X'/Theory 'Y'
- Etc.

#### Balancing Values

- Theory 'X' – External Accountability; People are not trusted.
- Theory 'Y' – Internal Accountability; Trust is everything.
- Read *The Human Side of Enterprise* by Doug McGregor for more info

#### Managing the Unexpected

- Hallmarks of High Reliability
  - Preoccupation with Failure
  - Reluctance to Simplify
  - Sensitivity to Operations
  - Commitment to Resilience
  - Deference to Experience

#### Judgment Call

- Which should we be using?
  - Serious Accident Investigation?
  - Facilitated Learning?
  - After Action Review?

#### Safety Assistance Team

- analysis designed for learning
- presented in a facilitated format designed for learning.

### Heinrich 1930's Research in Safety

- 1-10-30-100-300 Pyramid (for 1 tragic accident there are 10 serious accidents, 30 minor accidents, 100 near misses, 300 unsafe acts)
- Add one more layer - 1,000 pictures
- If one picture equals 1,000 words
- Then 1,000 Pictures X 1,000 Words equals "One million nuanced intuitive insights"

## **APPROPRIATE RESPONSE TO LONG DURATION FIRES – GEORGE WELDON**

*From Fire Use to Structure Protection – What are the relevant issues to Operations/Safety?*

### Appropriate Management Response (AMR) Objectives

- Strategy → Wildfire (put it out) or Wildland Fire Use (management for resource objectives) → All Responses (Full perimeter control, point protection, monitoring)
  - o Wildfire or Wildland Fire Use is agency dependent
- Strategy + Tactics = AMR
- The use of AMR during CY 2007 is the response to the high fire costs incurred during the CY 2006 Fire Season.

### History

- Wildland Fire Use primarily a Federal Land Management agency option
- The first use of prescribed natural fire for resource benefits in 1972
- 2007 Summary
  - o 110 Large Fires
  - o 30 Long term plans
  - o Wildfire Acres (entire GA) = 1,007,797
  - o WFU Acres = 94,352
  - o 975 initial attack success rate
  - o Moved resources to various fires
  - o Tactics used other than perimeter control

### Why Develop LTPs?

- Fire behavior limits tactical success
- Fire environment has exceeded our operational capability in a lot of situations
- Because we can't put the fire out:
  - o Since 1986
    - Western fire season 78 days longer
    - 4x increase in fires > 1000 acres
    - 6x increase in acres burned
    - increase in fires above 6500 feet
    - Response needs to be commensurate with values to protect (response to one fire affects your response to the next fire)
    - Evaluate the full range of responses & provides information to make informed decisions
    - Risk assessment improves probability of success
    - Difficult to go from WFSA to daily IAP on a 60-80 day fire
    - Mobility of resources
    - Brings partners together
    - Communication tool with the public
    - Opportunity for discussion of long term impacts
    - Establish guidelines for cost share agreements
    - Cost Review, RF Review Team

- Must have cost review over \$5,000,000
- LTP accomplished this

### Complexity of the Fire Environment

Fire complexity high at 1900, diminished until around 1980, and now has taken a steep upturn. It has now exceeded our capability to deal with the number of fires. New tools such as decision support, etc. are now available. However, we are still in a new age of fire complexity.

### Northern Rockies Fire Dynamics

- Duration of Flammability in high elevation fuels has changed from a short two to three weeks, to three months.

### Long Term Implementation Plan is (slide went by too fast!)

### Daily Fire Costs Showing Irregular Trend Compared to Historic Trends Graph (additional info missing)

### Recommended Components of a Long Term Plan

- Objectives
- Validations of the Wildland Fire Situation Analysis boundary
- Summary of Risk Assessment
- Identifications of threats to values at risk
- Actions to mitigate threats including probability of success.

### Possible components of a Long Term Plan

- Establish Management Action Points
- Resources needed to manage the fire Contingency Actions Information Plan

### Long Term Plans - Common themes for Success:

- Done Early
- All Partners included
- Good communication internally & externally
- Plans were updated
- Plans were used
- Knowledge and skills to manage long duration events
- Good relationships prior to fire season

### Northern Rockies 2008 Strategy

- Develop Long Term Plans
- Establish Management Action Points
- Firefighting resource mobility – the right resources in the right place at the right time.
- Utilize decision support products
- Informed decisions lead to more efficient management.

## **RETARDANT UPDATE – GEORGE WELDON**

Issue is only deals with USFS lands. The Judge Malloy has affirmed the USFS's use of retardant, but the USFWS must assess a "no harm" determination of retardant's impact on the critical habitat of numerous T&E species. There needs to be judicious use of retardant in 2008. Clarification on retardant's use is forthcoming.

## **UPDATE ON FEDERAL FIRE POLICY – GEORGE WELDON**

- No changes on Federal Fire Policy in 2008
- Some changes to the implementation of the Federal Fire Policy may occur in 2009.
- Some areas may be picked to test the WFLC decisions
- Draft document of the clarification of Community and Structure Protection guidelines passed out.
  - o These guidelines will be evaluated during 2008 within the Geographic Area and adjustments made for 2009.

## **HUMAN FACTORS AND INCIDENT MANAGEMENT STRESS – DR. BRIAN SHARKEY/DR. CHARLEY PALMER**

Since 2000, much data has been collected on the physiological side of operations personnel, but not much has been done to study the stress factors on Incident Management Teams.

The study is still in the information gathering stage.

- First question that will be asked: is this even an issue?
- Will be depending on IMTs to allow access for data collection
- Looking for data in as many areas of Teams as possible
- Will be looking at physiological markers, activity counts, sleep logs, interview Team members, and pencil/paper measures of stress.
- Enough data from a variety of sources will allow conclusions to be drawn and mitigations to be developed.
- Three week window from July-August where researchers will be tying in with Type 1 IMTs.

## **LONG DURATION FIRE MANAGEMENT – PAT GARBUTT, CHUCK STANICH, BOB LIPPINCOTT**

Where do we as IMTs fit into the process?

- Hosting Agency's responsibility to begin the process of the Long Term Implementation Plan
- Long duration events need the full support of the Logistics Section
- Base our actions on Fire Behavior over Time & Space.
- We will be using a dynamic, strategic document during long duration events.
- Need to simplify our actions to be able to communicate the mission to FFT1/FFT2 level and the public.
- Need to be able to understand our "employing agency's" mission during long-term events.
- IMT's I/A responsibilities during the course of a long duration fire need to be clarified.
- Probability of success needs to be explained and what failure will look like.
- Ops personnel need to have the flexibility to adjust resources needed for Management Action Points (MAP) in the event fire behavior changes over time & space.
- Objectives for each MAP need to be defined as the fire approaches it.
- MAPs need to have meaning so that all resources/agency administrators know what is at stake as the fire is approaching and the potential impacts.

What is the IMT/Ops role in the development and revision of Long Term Implementation Plans?

- Highly probable plan will be developed prior to IMT arrival
- IMTs perception of Management Action Points needs to be re-thought.
- IMTs need to be proactive and interface early in the incident with impacted agencies and public to explain our responsibilities and actions.

### How to implement a LTIP

- Actions and required resources should feed into the Incident Action Plan (short term plan)
- All partners are involved
- Periodic risk assessments

### What is a Long Term Implementation Plan?

- A set of decision support tools for managing an unplanned, long duration wildland fire with protection objectives.
- It works with and complements the Wildland Fire Situation Analysis.
- Should be included in the letter of delegation.
- Specific management actions from the Long Term Implementation Plan (are not an absolute) become assigned tasks in the Incident Action Plan.
- Details where, when and what needs to be done.
- Analogous of Stage III WFIP in WFU.

### Management Action Point (MAP)

- Most management actions should be conditional, i.e., predicted fire behavior, weather, incident objectives change, time of season.
- Think of a MAP as an evaluation tool.
- Include probability of success.
- A single value to be protected may have one or more MAPs.
- A MAP can be a point or a line.
- Can be used as an evaluation point for a number of actions, such as closures, notifications, evacuations, etc.
- MAP priorities may determine options and tactics
  - o May allow for movement/sharing of resources based on fire progression.

### MAP Questions:

- How does time, space, fuels affect your operations?
- How do you determine recommended resources?
- How do you assess risk and communicate it to the agency administrator?
- How do you evaluate when to wait, when to take action?
- How to triage the fire perimeter and determine where and when to take action?
- What actions and required resources should feed into the Incident Action Plan (short term plan)?
- Who are your partners?
- When do you do periodic risk assessments?

### LTIPs – Common Themes for Success from 2007 Fire Season:

- Done early
- All partners included
- Good communication internally & externally
- Plans were updated
- Plans were used
- Knowledge and skills to manage long durations events
- Good relationships prior to fire season

### Comments:

- One of the most important things that we do is to ask questions when validating the Long Term Implementation Plans.
- Models need to be re-run as fire suppression actions are taken and their impact on the projections.
- Some models and maps (e.g., FSPRO runs) need to be protected from view since they may be based on the fact they depict the fire projections with no suppression actions.
- How do you explain probability of success and consequences of failure?
- Each team needs to decide what tools they need for decision making.

## **SAFETY ZONE STUDY – BRETT BUTLER**

### ***Safety Zones on Slopes: Are new guidelines needed?***

#### Current Safety Zone Standards

- Principles used to develop safety zone guidelines:
  - o Used a combination of mathematical/computer modeling and experimental results.
  - o Developed guidelines that predict the worst case situations.
  - o The separation distance between a firefighter and the flames should be at least four times the flame height (see Guidelines found in IRPG and FLHB)

#### Limitations of current standards:

- Radiant Heat only
- Flat Terrain
- No Convection/Wind
- Circular flame front

#### Safety Zones on Slopes: Surveys/Interviews

- Survey by Jim Steele polled 377 firefighters. Respondents have an extremely broad idea of the proper size of a safety zone. Perception of safety zone size in Heavy Timber ranged from .15 acres to 640 acres

#### Safety Zones on Slopes

- What effect does position on slope play in minimum safe separation distance?
- Four Cases were considered:
  - 1) Safety zone upslope of a spreading fire
    - a. Assumptions – 1) Fire stops at edge of SZ; 2) No strong upslope winds
    - b. Radiant energy is reduced but convection may be significant
  - 2) Safety zone down slope of spreading fire
    - a. Assumptions – 1) Fire stops at edge of SZ; 2) No strong down slope winds
    - b. 4X Flame height applies unless there are strong down slope winds
  - 3) Safety zone at top of ridge with fire below
    - a. Assumptions – 1) Fire stops at edge of SZ
    - b. 4X Flame Height applies
    - c. If strong cross ridge winds then SZ needs to be outside of the recirculation zone.
  - 4) Safety zone at base of slope below downslope spreading fire.
    - a. Assumptions – 1) Fire stops at edge of SZ; 2) No strong down slope winds
    - b. 4X Flame height applies unless there are strong down slope winds



### Summary of four case studies:

- 1) Upslope convection biggest unknown.
- 2) 4 x flame height works in most cases.
- 3) Lesson from 30 mile -- maximize distance from fuels.
- 4) Allow extra travel time for uphill escape routes.

### Issues:

- Other variables:
  - o Wind Speed and Direction
  - o Slope Angle
  - o Slope Concavity
  - o Escape Routes – Firefighter Travel Rates
    - Strong function of slope
    - Travel rate increases by 25% w/o packs
    - Travel rate decreases with escape route length

### Research Methods for Slope Safety Zone standards to include:

- Mathematical models of energy transfer.
  - o Wind/slope interactions will be measured.
  - o Slope
  - o Slope Concavity
- Field measurements of convective heating ahead of fires.
  - o Research Team has full set of instruments/cameras
  - o Team is carded for fireline duty.
  - o Team has Operations Plan and JHA completed.
  - o Team has full PPE, radios, and other gear.
- Interviews/Surveys of firefighters

### Possible products from study:

- Modifications to current standards
- New, separate standards for slopes
- Pocket Card?
- Computer program?

### How can IMTs help?

- Facilitate field efforts.
- Provide support and direction on survey/interview.
- Provide support and direction on best output format.
- Feedback from deployment/entrapments.

## **OPERATION/SAFETY/AVIATION ROUND ROBIN ISSUES**

- IOSWT still working on Typing changes for Crews.
- Operational period lengths and impacts to personnel
  - o Adjustments needed to take advantage of burning conditions, etc.
  - o Time of year impacts shift length.

(Time constraints prevented additional discussion on Round Robin issues)